What is claimed is:

1. A method for depositing metal on a semiconductor device having a substrate, an exposed first surface, and an exposed second surface, comprising:

depositing metal ions on the exposed first surface and on the exposed second layer by applying a first voltage between the substrate and an anode in the presence of an electrolytic bath; and

removing metal ions from the exposed first surface by applying a second voltage between the substrate and the anode in the presence of the electrolytic bath.

2. The method of claim 1, wherein the exposed first surface has a first potential and the exposed second surface has a second potential.

3. The method of claim 1, wherein the semiconductor device includes an insulator layer between the first layer and the second layer, the method further comprising placing a first potential on the first layer and placing a second potential on the second layer.

4. The method of claim 1, wherein the metal ions include copper ions.

5. The method of claim 1, wherein applying a first voltage and applying a second voltage includes applying a bipolar modulated voltage between the substrate and the anode.

6. A method for depositing copper on a semiconductor device having a substrate, an exposed first surface, and an exposed second surface, comprising:

providing a voltage with a positive duty cycle between the substrate and an anode in the presence of an electrolytic bath containing copper ions to deposit copper ions on the exposed first layer and the exposed second layer during the positive duty cycle; and

providing a voltage with a negative duty cycle between the substrate and an anode in the presence of the electrolytic bath to remove copper ions from the exposed first layer during the negative duty cycle.

7. The method of claim 6, wherein the exposed first surface has a first potential and the exposed second surface has a second potential.

8. The method of claim 6, wherein the semiconductor device includes an insulator layer between the first layer and the second layer, the method further comprising placing a first potential on the first layer and placing a second potential on the second layer.

9. The method of claim 6, wherein the first layer comprises polysilicon and the second layer comprises titanium nitride.

10. A method for depositing metal on a semiconductor device having a substrate, an exposed first surface, and an exposed second surface, comprising:

placing the semiconductor device in an electrolytic bath;

applying a first voltage between the substrate and an anode, the first voltage being sufficient to deposit metal ions on the exposed first layer and the exposed second layer; and

applying a second voltage between the substrate and the anode, the second voltage being sufficient to remove metal ions from the exposed first layer and retain metal ions on the exposed second layer.

11. The method of claim 10, wherein the metal ions include copper ions.

12. The method of claim 10, wherein the metal ions includes nickel ions.

13. The method of claim 10, wherein the metal ions includes palladium ions.

14. The method of claim 10, further comprising placing a third voltage on one of the exposed first layer and the exposed second layer.

15. The method of claim 14, further comprising placing a fourth voltage on the other of the exposed first layer and the exposed second layer.

16. A method for depositing metal on a semiconductor device having a substrate, an exposed first surface, and an exposed second surface, comprising:

placing the semiconductor device in an electrolytic bath containing metal ions; and

applying a bipolar modulated voltage between the substrate an anode, the bipolar modulated voltage having a first duty cycle and a second duty cycle to deposit metal ions on the exposed first layer and on the exposed second layer during the first duty cycle and to remove metal ions from the exposed first layer and retain metal ions on the exposed second layer during the second duty cycle.

17. The method of claim 16, wherein the first duty cycle provides a potential difference between the anode and the first and second layers that exceeds a reduction potential of the metal, and the second duty cycle provides a potential difference between the anode and the first layer that is less than a reverse deposition potential of the metal.

18. The method of claim 16, further comprising applying a first potential on one of the first layer and the second layer.

19. The method of claim 18, further comprising applying a second potential on the other one of the first layer and the second layer.

20. The method of claim 16, wherein applying a bipolar modulated voltage includes applying a square wave.

21. A method for depositing copper on a semiconductor device having a substrate, an exposed first surface, and an exposed second surface, comprising:

placing the semiconductor device in an electrolytic bath containing copper ions; and

applying a bipolar modulated voltage between the substrate an anode, the bipolar modulated voltage having a first duty cycle and a second duty cycle to deposit copper ions on the exposed first layer and on the exposed second layer during the first duty cycle and to remove copper ions from the exposed first layer and retain copper ions on the exposed second layer during the second duty cycle.

22. The method of claim 21, wherein the first duty cycle provides a potential difference between the anode and the first and second layers that exceeds a reduction potential of the copper, and the second duty cycle provides a potential difference between the anode and the first layer that is less than a reverse deposition potential of the copper.

23. The method of claim 21, further comprising placing a first potential on the first layer and a second potential on the second layer prior to applying the bipolar modulated voltage.

24. The method of claim 21, wherein applying a bipolar modulated voltage includes applying time-varying waveform selected from a group of waveforms consisting of: a square wave, a triangle wave and a sinusoidal wave.

25. A method for depositing nickel on a semiconductor device having a substrate, an exposed first surface, and an exposed second surface, comprising:

placing the semiconductor device in an electrolytic bath containing nickel ions; and

applying a bipolar modulated voltage between the substrate an anode, the bipolar modulated voltage having a first duty cycle and a second duty cycle to deposit nickel ions on the exposed first layer and on the exposed second layer during the first duty cycle and to remove nickel ions from the exposed first layer and retain nickel ions on the exposed second layer during the second duty cycle.

26 The method of claim 25, wherein the first duty cycle provides a potential difference between the anode and the first and second layers that exceeds a reduction potential of the nickel, and the second duty cycle provides a potential difference between the anode and the first layer that is less than a reverse deposition potential of the nickel.

27. The method of claim 25, further comprising placing a first potential on the first layer and a second potential on the second layer prior to applying the bipolar modulated voltage.

28. The method of claim 25, wherein applying a bipolar modulated voltage includes applying time-varying waveform selected from a group of waveforms consisting of: a square wave, a triangle wave and a sinusoidal wave.

29. A method for depositing palladium on a semiconductor device having a substrate, an exposed first surface, and an exposed second surface, comprising:

placing the semiconductor device in an electrolytic bath containing palladium ions; and

applying a bipolar modulated voltage between the substrate an anode, the bipolar modulated voltage having a first duty cycle and a second duty cycle to deposit palladium ions on the exposed first layer and on the exposed second layer during the first duty cycle and to remove nickel ions from the exposed first layer and retain palladium ions on the exposed second layer during the second duty cycle.

30. The method of claim 29, wherein the first duty cycle provides a potential difference between the anode and the first and second layers that exceeds a reduction potential of the palladium, and the second duty cycle provides a potential difference between the anode and the first layer that is less than a reverse deposition potential of the palladium.

31. The method of claim 29, further comprising placing a first potential on the first layer and a second potential on the second layer prior to applying the bipolar modulated voltage.

32. The method of claim 29, wherein applying a bipolar modulated voltage includes applying time-varying waveform selected from a group of waveforms consisting of: a square wave, a triangle wave and a sinusoidal wave.